

**FABRICATION OF SILICON-ON-INSULATOR STRUCTURE
USING PLASMA IMMERSION ION IMPLANTATION**

ABSTRACT

A method of fabricating a silicon-on-insulator structure having a silicon surface layer in a semiconductor workpiece, is carried out by maintaining the workpiece at an elevated temperature and producing an oxygen-containing plasma in the chamber while applying a bias to the workpiece and setting the bias to a level corresponding to an implant depth in the workpiece below the silicon surface layer to which oxygen atoms are to be implanted, whereby to form an oxygen-implanted layer in the workpiece having an oxygen concentration distribution generally centered at the implant depth and having a finite oxygen concentration in the silicon surface layer. The oxygen concentration in the silicon surface layer is then reduced to permit epitaxial silicon deposition.